

Fresno Supersite Quarterly Report

September 30, 2000

1. INTRODUCTION

The Fresno Supersite intends to: 1) test and evaluate non-routine monitoring methods, with the intent to establish their comparability with existing methods and determine their applicability to air quality planning, exposure assessment, and health impact determination; 2) increase the knowledge base of aerosol characteristics, behavior, and sources so regulatory agencies can develop standards and strategies that protect public health; and 3) acquire measurements that can be used to evaluate relationships between aerosol properties, co-factors, and observed health end-points. Supersite observables include *in-situ*, continuous, short duration measurements of: 1) PM_{2.5}, PM₁₀, and coarse (PM₁₀ minus PM_{2.5}) mass; 2) PM_{2.5} sulfate, nitrate, carbon, light absorption, and light extinction; 3) numbers of particles in discrete size bins ranging from 0.005 to ~10 µm; 4) criteria pollutant gases (O₃, CO, NO_x); 5) reactive gases (NO_y, HNO₃, NH₃); and 6) single particle characterization by time of flight mass spectrometry. Field sampling and laboratory analysis are applied for: 1) gaseous and particulate organic compounds (light hydrocarbons, heavy hydrocarbons, carbonyls, polycyclic aromatic hydrocarbons [PAH] and other semi-volatiles); and 2) PM_{2.5} mass, elements, ions, and carbon. Observables common to other Supersites, including: 1) daily PM_{2.5} 24-hour average mass with Federal Reference Method (FRM) samplers; 2) continuous hourly and five minute average PM_{2.5} and PM₁₀ mass with Beta Attenuation Monitors (BAM) and Tapered Element Oscillating Microbalances (TEOM); 3) PM_{2.5} chemical speciation with an EPA speciation monitor and protocol; 4) coarse particle mass by dichotomous sampler and difference between PM₁₀ and PM_{2.5} BAM and TEOM measurements; 5) coarse particle chemical composition; and 6) high sensitivity and time resolution scalar and vector wind speed, wind direction, temperature, relative humidity, barometric pressure, and solar radiation. The Fresno supersite is coordinated with health studies that will use these data in establishing relationships with asthma, other respiratory disease, and cardiovascular changes in animal subjects.

2. ACCOMPLISHMENTS

- Participated in Fresno Supersite/California Regional PM₁₀/PM_{2.5} Air Quality Study (CRPAQS) coordination meeting in Fresno, CA, on July 11–12, 2000.
- Participated in USEPA/Battelle Environmental Technology Verification Program Fresno site test planning meeting in Fresno, CA, on September 15, 2000.
- Conducted independent field flow audit by DRI auditor, Dale Crow, on the week of August 6, 2000. Standard operating procedures are being followed for the operation. All instruments are within ±5% of the specified flow rates.
- Evaluated nitric acid and ammonia denuder efficiency by replacing denuder on every sample starting July 5, 2000.

- Evaluated continuous ammonia monitors. No currently available units were found to be acceptable.
- Evaluated the Luminol NO₂/PAN monitor modified by U.C. Riverside, and plan to start operation on December 1, 2000.
- Completed installation of a Radiance PM_{2.5} nephelometer and started operation on August 14, 2000.
- Replaced the Aerosol Dynamics Inc. prototype continuous nitrate monitor with a Rupprecht & Patashnick 8400N automated nitrate monitor on August 1, 2000. Installed and began operation of a collocated R&P 8400N on August 23, 2000.
- Replaced XAD carbon denuder with charcoal-impregnated parallel cellulose-fiber denuder and started testing on July 11, 2000.
- Assembled and validated continuous monitoring data through August 2000.
- Continued operation of monitoring instruments described in “Air Quality Measurements from the Fresno Supersite”.

3. **FUTURE PLANS**

- Continue to define variable names and submit Phase I Fresno continuous measurements to the ARB-sponsored CRPAQS data base.
- Complete revisions to Standard Operating Procedures.
- Complete a Quality Assurance Project Plan (QAPP).
- Upgrade the LABVIEW based data acquisition system to integrate additional instruments.